AMENDMENTS TO THE CLAIMS:

The following listing of claims supersedes all prior versions and listings of claims in this application:

1. (Currently Amended) A method of evaluating the position of a time-varying disturbance on a transmission link, the method comprising ~~including the steps of~~:

copying, at least in part, an output signal from a source, such that there is a pair of signal copies;

transmitting the pair of signal copies onto the transmission link;

receiving in a return direction from the transmission link return signals comprising backscattered components comprising at least partially returned copies of said signal copies previously transmitted on said transmission link, wherein at least one of said backscattered components has suffered a phase change caused by said time-varying disturbance ~~thereon~~;

combining the received returned signal copies of a transmitted pair so as to produce a combination signal; and[[,]]

using a temporal characteristic in the combination signal to evaluate the position of the time-varying disturbance on the transmission link,

wherein the position of the disturbance is determined from the time of return of said phase-modulated backscattered components of said returned signal copies.

2. (Original) A method as claimed in claim 1, wherein the temporal characteristic includes the time at which a disturbance feature occurs in the combination signal.

3. (Currently Amended) A method as claimed in claim 1, wherein said backscattered components comprise signal copies [[are]] returned by a process of distributed backscattering as the signal copies travel along the transmission link.

4. (Original) A method as claimed in claim 3, wherein the source is configured to produce output signals having the form of optical pulses, each optical pulse giving rise to a combination signal that is distributed over time as the pulse travels along the transmission link.

5. (Currently Amended) A method as claimed claim 1, wherein:

the combination signal is sampled at a first set of spaced apart temporal positions and at a second set of temporal position, and ~~a wherein~~

the first and second sampled sets are compared in a comparison step.

6. (Original) A method as claimed in claim 5, wherein the temporal positions of the first and second sets are interleaved.

7. (Previously Presented) A method as claimed in claim 5, wherein the comparison step involves generating a set of data which is at least in part dependent on the difference between the first and second sets.

8. (Currently Amended) A method as claimed in claim 1 ~~any of the preceding claims~~, wherein the signal copies are carried along a common transmission medium of the optical transmission link.

9. (Previously Presented) A method as claimed in claim 1, wherein signal copies of a pair travel along the transmission link with a differential delay relative to one another.

10. (Original) A method as claimed in claim 9, wherein the differential delay is caused at an unbalanced interferometer coupled to an optical source, the interferometer having a first path and a second path, the transit time of the first path being longer than that of the second path, signal copies of a pair being caused to travel along a different respective path to one another.

11. (Original) A method as claimed in claim 10, wherein the interferometer has a first coupling stage which is coupled to the source, the coupling stage being arranged to

channel one portion of the incoming radiation intensity from the source along one path, and another portion of the incoming radiation intensity along the other path, so as to form the first and second signal copies.

12. (Original) A method as claimed in claim 11, wherein the interferometer has a second coupling stage for combining radiation from the first and second paths, and for coupling the combined radiation to the common communications link.

13. (Currently Amended) A method as claimed in claim 12, wherein the signals returned from the second location are each ~~channelled~~ channeled along the first and second paths by a second coupling stage, and wherein the so ~~channelled~~ channeled signals are subsequently combined at the first coupling stage.

14. (Previously Presented) A method as claimed in claim 1, wherein the signal copies of a pair are delayed relative to one another at a first location, and wherein at disturbance is detectable at a second location remote from the first location.

15. (Currently Amended) A method as claimed in claim 1, ~~where! n~~ wherein each of the signal copies of a pair is disturbed by a detected disturbance.

16. (Currently Amended) A method as claimed in claim 1, wherein the signal copies of a pair travel in the same [[sense]] direction along the transmission link.

17. (Previously Presented) A method as claimed in claim 1, wherein the output signals have an average phase-coherence time associated therewith of less than 1 pico seconds.

18. (Original) A method as claimed in claim 17, wherein the signal copies of a pair have a differential delay time associated therewith, the delay time being greater than the average phase-coherence time by a factor of at least 1000.

19. (Currently Amended) A method as claimed in claim 1 wherein the transmission link includes an optical ~~channel~~ fibre extending along a guide track, the guide track being arranged to guide the movement of a vehicle, the optical fibre ~~channel~~ being arranged such that movement of the vehicle causes a disturbance along the optical fibre ~~channel~~.

20. (Currently Amended) A method as claimed in claim 19, wherein the path of the optical channel crosses the track at intervals ~~inverals~~.

21. (Previously Presented) A method as claimed in claim 19, wherein the guide track has the form of one or more rails for guiding the movement of a train.

22. (Currently Amended) A apparatus for evaluating the position of a time-varying disturbance on a transmission link, the apparatus comprising ~~including~~:

means for copying, at least in part, an output signal from a source, such that there is a pair of signal copies;

means for transmitting the signal copies onto the transmission link, wherein said signal copies of a pair of travel along the transmission link with a differential delay relative to one another;

means for receiving in a return direction from the transmission link return signals comprising backscattered components comprising at least partially returned backscattered copies of said signal copies previously transmitted thereon, wherein at least one of said backscattered components has suffered a phase change caused by said time-varying disturbance;

means for combining the received returned signal copies of a transmitted pair so as to produce a combination signal; and[[,]]

monitoring means for monitoring the combinations signal as a function of time,

wherein said monitoring means monitors a temporal characteristic in the combination signal to evaluate the position of the time-varying disturbance on the transmission link, and

wherein the position of the disturbance is determined from the time of return of phase-modulated backscattered components of said returned signal copies.

23. (Original) A apparatus as claimed in claim 22, wherein the monitoring means includes a display device for displaying the combination signals as a function of time.

24. (Previously Presented) A apparatus as claimed in claim 22, wherein delay means is provided for delaying the signal copies of a pair relative to one another.

25. (Original) A apparatus as claimed in claim 24, wherein the delay means is provided by an interferometer stage, the interferometer stage having first and second transmission legs and coupling means for coupling to or from the first and second legs, and wherein the means for copying output signals and the means for combining the received signal copies are formed in common by the coupling means.

26. (Currently Amended) A monitoring station for monitoring a transmission link, the monitoring station comprising ~~having~~:

a source for generating output signals;

an interferometer stage for copying at least in part the output signals from the source such that for each output signal, there is a pair of signal copies;

an output for launching the signal copies onto the transmission link; and[[,]]

a processor circuit;

wherein the interferometer stage is arranged to receive signal copies returned by a process of distributed backscattering from the link and to combine the signal copies so as to produce an interference signal, wherein at least one of said backscattered signal copies has suffered a phase change, [[and[[

wherein the processor circuit is arranged to store the interference signal in association with an indication of a temporal characteristic of the return signal, and

wherein said phase change is caused by a time-varying disturbance, said interference signal stored in association with an indication of a temporal characteristic of the return signal enables the position of the disturbance to be determined from the time of return of phase-modulated backscattered components of said return signal copies.

27. (Original) A monitoring station as claimed in claim 26, wherein the interference signal is a time-distributed signal which varies with time, and wherein a temporal characteristic is the time variation of the return signal.

28. (Previously Presented) A monitoring station as claimed in claim 26, wherein the interference signal is a time-distributed signal, and the processor circuit is arranged to sample the interference signal at intervals, and to store the samples in association with a respective return time for each sample.

29. (Previously Presented) A monitoring station as claimed in claim 26, wherein the source is an optical pulse source.

30. (Currently Amended) A sensing system for sensing the position of a moving vehicle, the sensing system comprising ~~having~~:

a guide track for guiding the movement of the vehicle;

an optical fibre ~~channel~~ extending along the guide track; and[[,]]

monitoring apparatus coupled to the optical channel,

wherein the optical fibre ~~channel~~ is mechanically coupled to the guide track such that movement of the vehicle causes a moving disturbance to be sensed by a sensing

optical signal propagating along the optical fibre ~~channel~~, the monitoring apparatus being configured to:

(i) detect ~~a light~~ said sensing optical signal from the optical fibre, wherein said sensing light signal is ~~channel~~ indicative of [[a]] the moving disturbance,

(ii) evaluate at least one temporal characteristic of the sensing optical ~~light~~ signal, and

(iii) in dependence on the evaluated temporal characteristic, determine an indication of the position of the moving disturbance along the optical fibre ~~channel~~ so that the position of the vehicle along the track can be sensed.

31. (Currently Amended) A method of sensing the position of a vehicle moving along a guide track, wherein there is provided an optical fibre ~~channel~~ extending along the guide track, and monitoring apparatus coupled to the optical fibre ~~channel~~, the optical channel being mechanically coupled to guide track such that movement of the vehicle causes a moving disturbance to be sensed by a sensing optical signal propagating along the optical fibre ~~channel~~, the method comprising ~~including the steps of~~:

(i) detecting a light signal from the optical fibre ~~channel~~ indicative of a the moving disturbance;

(ii) evaluating at least one temporal characteristic of the light signal;

(iii) in dependence on the evaluated temporal characteristic, determining an indication of the position of the moving disturbance along the optical fibre ~~channel~~; and

(iv) inferring the position of the vehicle from the position of the disturbance along the optical fibre ~~channel~~.

32. (Currently Amended) A method of monitoring a transmission link to detect a physical disturbance of the link, the method comprising ~~including the steps of~~:

copying, at least in part, an output signal from a source, such that there is a pair of signal copies;

means for delaying one of said signal copies in said pair of signal copies relative to another one of said signal copies in said pair of signal copies;

transmitting the signal copies onto a common communications link, wherein said signal copies of a pair travel along the transmission link with a differential delay relative to one another;

receiving in a return direction from the transmission link return signals comprising backscattered components comprising at least partially reflected backscattered copies

previously transmitted on said transmission link, wherein at least one of said backscattered components has suffered a phase change caused by a time-variation of said physical disturbance ~~thereon~~;

combining the received returned signal copies of a pair so as to produce a combination signal;

monitoring the combination signal to detect a disturbance feature in the combination signal, from which disturbance feature the presence of a disturbance can be inferred; and[[,]]

from a temporal characteristic in the combination signal, estimating the position of the disturbance on the communications link, wherein the position of the disturbance is determined from the time of return of phase-modulated backscattered components of said returned signal copies.

33. (New) A sensing system as claimed in claim 30, wherein the sensing optical signal comprises a pair of signal copies, and wherein phase differences in said pair of signal copies are combined in order to form an interference signal, so that time-varying phase changes in said optical fibre brought about by said disturbance result in a phase difference between the signal pairs, which is converted into an amplitude change in said interference signal.